

# SPECIFICATIONS

MULTILAYER CHIP ANTENNA

AH 104F2450S1-T

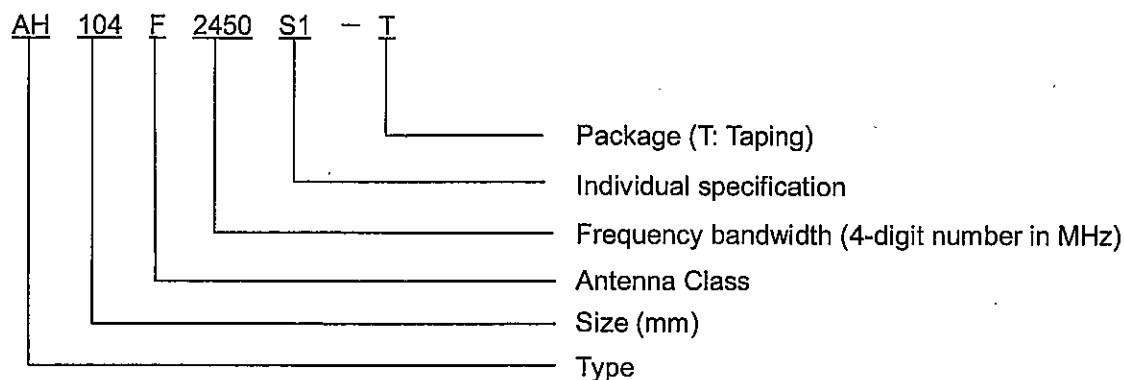
TAIYO YUDEN CO., LTD.

Date : 18.Mar.2008

## 1.0 Scope

This specification covers the multilayer chip antenna in mounted condition on Taiyo Yuden evaluation board.

### Part Numbering System



## 2.0 Environment condition (Refer to the reliability test of table -1 for the reliability assurance)

- 2.1 Operating temperature range : -20°C to +80°C
- 2.2 Humidity : 15 to 95%RH (Without dew condensation)
- 2.3 Storage temperature range (Antenna of single unit)  
: -40°C to +85°C
- 2.4 Storage temperature and humidity range (packing condition)  
: -10°C to +40°C, 15 to 85% RH

## 3.0 Electrical characteristics

- 3.1 Input Impedance : 50Ω (Specified value)
- 3.2 Frequency bandwidth : 2400 to 2500MHz
- 3.3 Gain\*<sup>1</sup>  
: +2 dBi min. (Peak)  
: 0 dBi min.  
(Vertical polarization average gain of omni directional plane)  
: -6 dBi min. (Total average gain)
- 3.4 VSWR in bandwidth\*<sup>2</sup> : 2.0 (Typical)

\* 1: Total average gain in 3.3 of electrical characteristics shall be total average gain of V, H polarization in X-Y, Y-Z and X-Z side (Average of total measurement points) in mounted on Taiyo Yuden evaluation board.

\* 2: VSWR in bandwidth in 3.4 of electrical specification shall be VSWR mounted on Taiyo Yuden on standard board.

## 4.0 Mechanical performance

- 4.1 Shape dimension, indication mark: Refer to figure -1. Sealed letter shall be D47.
- 4.2 Dimension of evaluation board and land-patterns: Refer to figure -2, 3.

## 5.0 Reliability test

Reliability test : To satisfy a reliability test per table -1.

## 6.0 packing specification

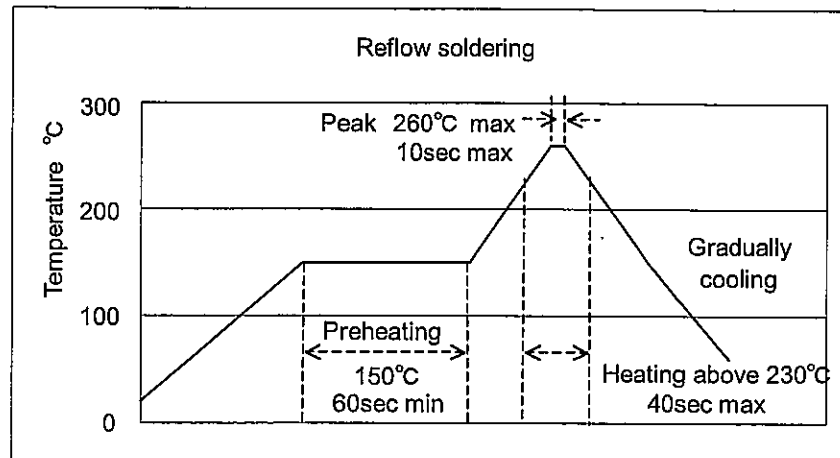
Packing form : Refer to pages 10 to 12.

## 7.0 Precautions

Refer to precautions in page 9.

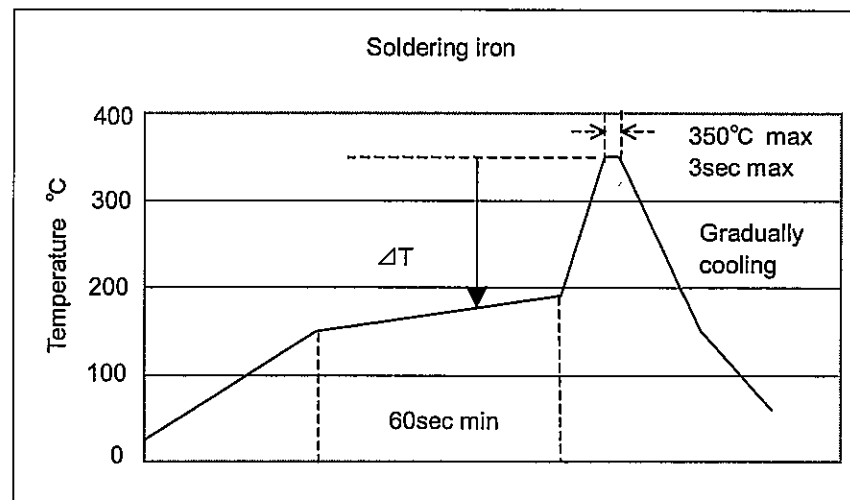
## Recommended Soldering Condition

### Recommended Soldering Profiles for Lead-free Solder Paste



※Components should be preheated to within 100 to 130°C from soldering temperature.

※Assured to be reflow soldering for 2 times



※  $\Delta T \leq 190^\circ\text{C}$  (3216Type max) ,  $\Delta T \leq 130^\circ\text{C}$  (3225Type min)

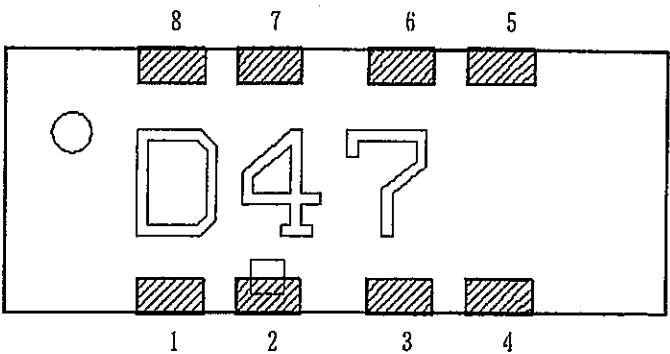
※It is recommended to use 20W soldering iron and the tip is 1  $\phi$  or less.

※The soldering iron should not directly touch the components.

※Assured to be soldering iron for 1 time.

Note: The above profiles are the maximum allowable soldering condition, therefore these profiles are not always recommended.

Pin arrangement



※Top side view

1	GND	5	NC
2	FEED	6	NC
3	NC	7	NC
4	NC	8	NC

※Top side view

Indication and marker

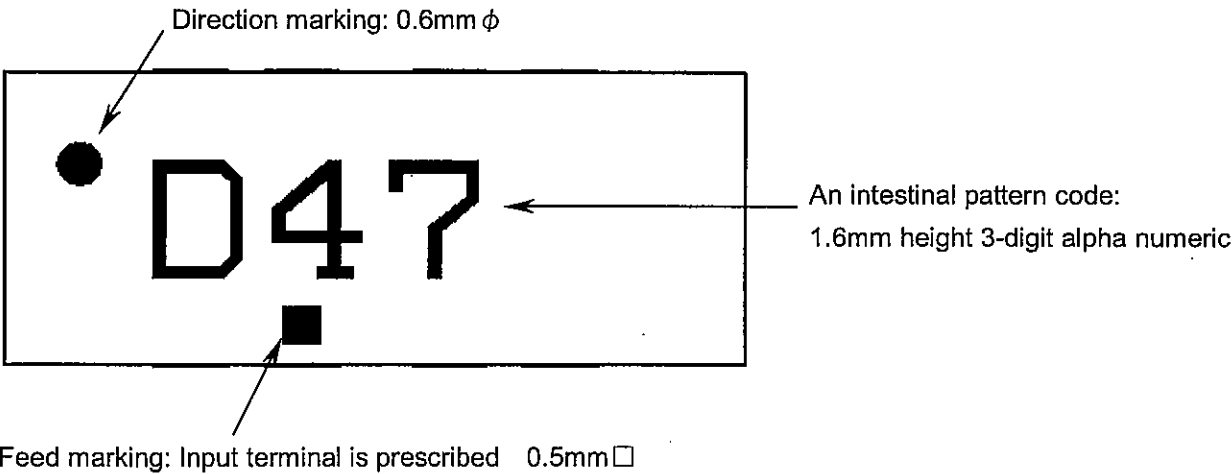
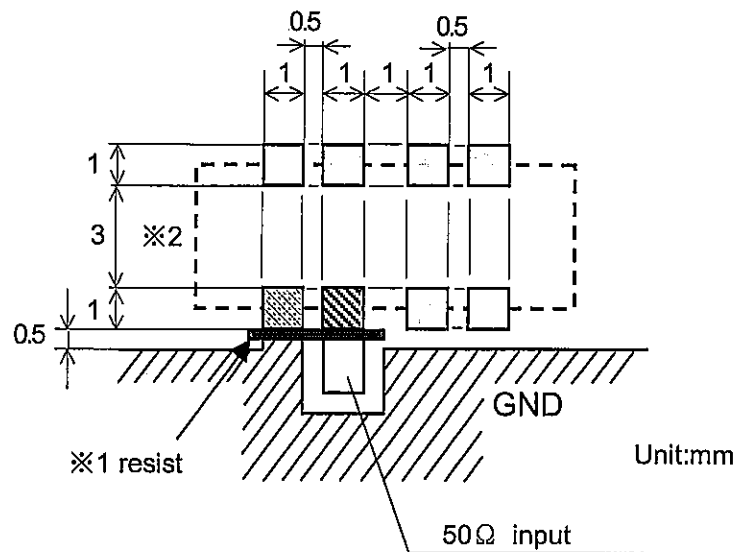





Figure -3

Antenna land-patterns (Tentative)



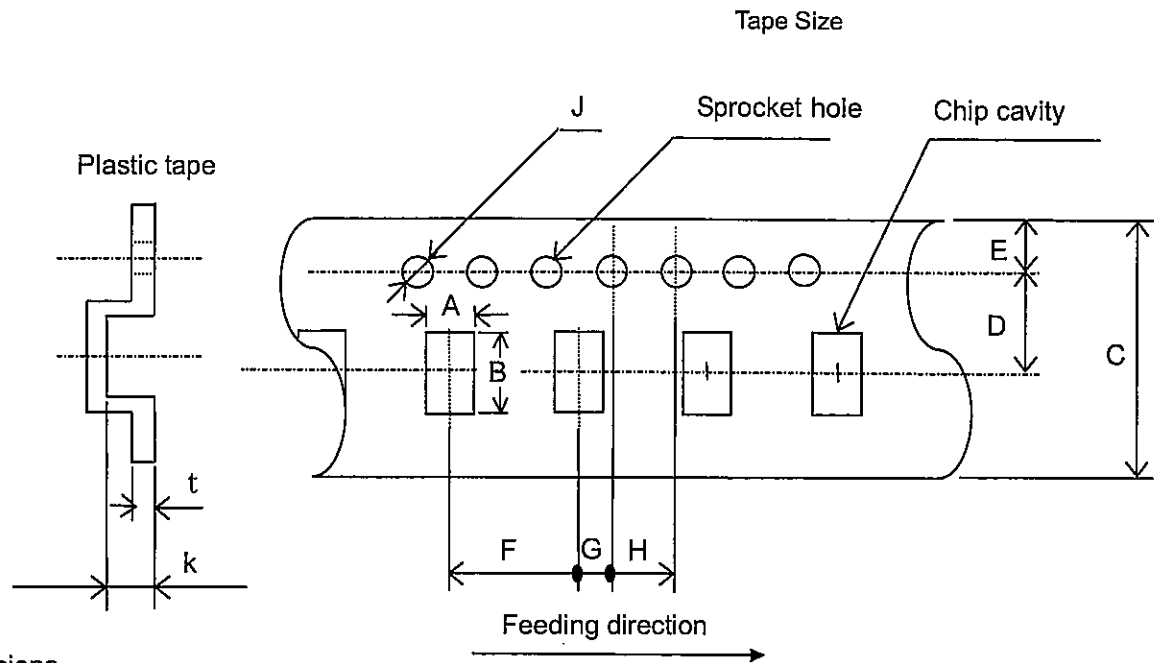
-  Land for input terminal
-  Land for GND terminal
-  Land for NC terminal

※1 : A solder area is set at solder resist.

※2 : Don't arrange the pattern on near, surface and inside layer to the antenna mounting area.  
(Refer to our company evaluation circuit board.)

## Tape Packaging (T)

◎In case of taping packing, plastic tapes shall be used.



### Dimensions

Type	A※	B※
1041	$4.35 \pm 0.2$	$10.35 \pm 0.2$

[Unit : mm]

### Dimensions

C	D	E	F	G	H	J	K※	t
$24.0 \pm 0.3$	$11.5 \pm 0.1$	$1.75 \pm 0.1$	$8.0 \pm 0.1$	$2.0 \pm 0.1$	$4.0 \pm 0.1$	$\phi 1.5^{+0.1}_{-0}$	1.45 max.	0.3 max.

※A, B, K: Sufficient clearance.

[Unit : mm]

### Dimension of Reel

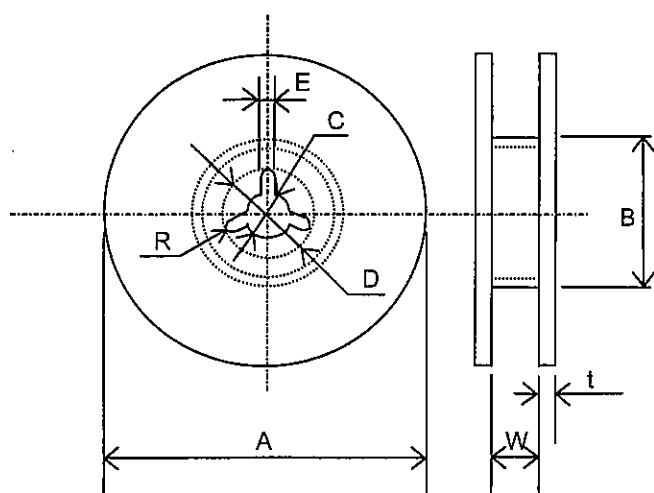
Code	A	B	C
Size	$\phi 330 \pm 2.0$	$\phi 100 \pm 1$	$\phi 13.0 \pm 0.2$

Code	D	E	W
Size	$\phi 21.0 \pm 0.8$	$2.0 \pm 0.5$	$25.5 \pm 1.0$

Code	t	R
Size	3.0 max.	1.0

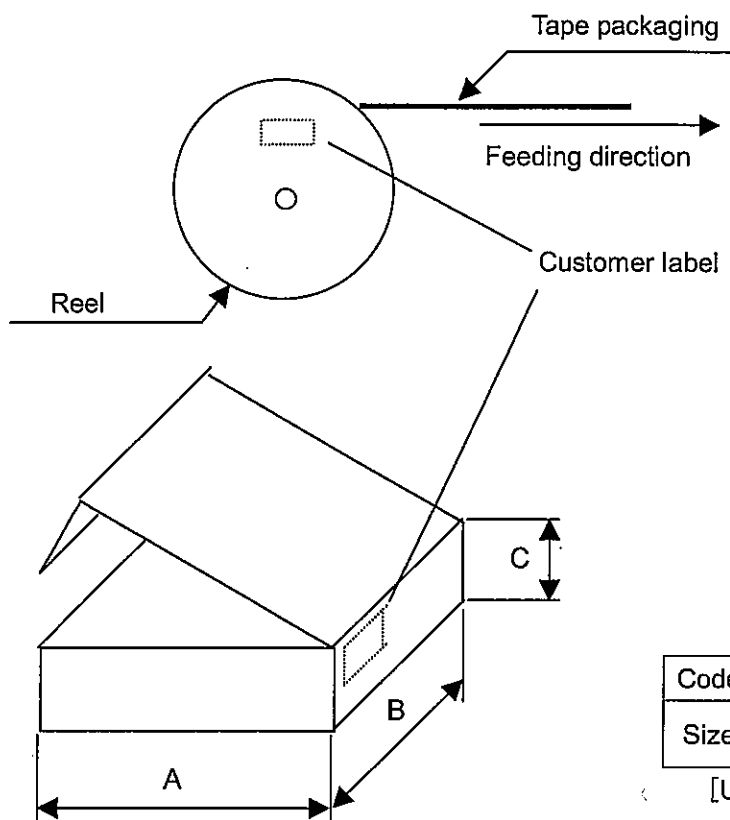
[Unit : mm]

### Dimensions of Reel



# Tape Packaging (T)

[Packaging Mode]



Customer label description

1. Manufacturer Name
2. Customer Parts No.
3. Our Parts No.
4. Quantity
5. Control No.  
(Shipping Lot No.)
6. Manufacturing site  
(MADE IN ○○○)

Code	A	B	C	Reel
Size	350	340	75	2 Reel max

[Unit : mm] (The size is only for reference.)

Material: Paper

Packaging unit: Maximum 2reels in a box.

- To attach labels means that all products are passed.

Operating conditions for guarantee of this product are as shown in the specification.

Please note that Taiyo Yuden Co., Ltd. shall not be responsible for a failure and/or abnormality which are caused by use under the conditions other than the aforesaid operating conditions.

This product is developed, designed and intended for use in general electronics equipments. (for AV, household, office supply, information service, telecommunications, etc.). Before incorporating the components into any equipments in the field such as aerospace, aviation, nuclear control, submarine, transportation, (automotive driving and control, passenger protection, train control, ship control), transportation signal, disaster prevention, medical, public information network etc.

where higher safety and reliability are especially required, please contact Taiyo Yuden Co., Ltd. for more detail in advance.

And before incorporating the components or devices into the equipments not mentioned in the above, if there is possibility of direct damage or injury to human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.



**Deadline for returning of tender specification**

**Please acknowledge and return this specification within 1 year after submission.  
In case of no acknowledgement and returning within 1 year, the specification will  
be invalidated.**

**The specification will be resubmitted upon request.**

# チップアンテナ CHIP ANTENNA

OPERATING TEMP. -20~+80°C



リフロー／REFLOW

## 特長 FEATURES

- ・小型・低背
- ・広帯域・高利得
- ・安定した温度特性

- ・ Compact, Lower profile.
- ・ Wide bandwidth, High Gain.
- ・ Stable temperature characteristics.

## 用途 APPLICATIONS

- ・ Bluetooth<sup>®</sup>、無線LAN、GPS

- ・ Bluetooth<sup>®</sup>, Wireless LAN, GPS

## 形名表記法 ORDERING CODE

1

形式

AH	積層アンテナ
AF	ヘリカルアンテナ

2

電極仕様

△	メッキ品
---	------

△＝スペース

3

形状寸法 [mm]

216	2.5×1.6
042	4.0×2.0
083	8.0×3.0
104	10.0×4.0
122	12.0×2.0
116	11.0×1.6

4

種別コード

F	逆F
N	モノポール (デュアルバンド)
M	モノポール

5

周波数 (MHz)

例	
2450	2400～2500
5250	5150～5350
1575	1574.397～1576.443

1.中心周波数を記載。  
2.デュアルバンドは下の周波数。

6

個別仕様

01～	
-----	--

7

包装

-T	テーピング
----	-------

A

H

△

0

8

3

F

2

4

5

0

0

1

-

T

1

2

3

4

5

6

7

1

Type

AH	Multilayer Antenna
AF	Helical Antenna

2

Electrode code

△	With Plating
---	--------------

△=Blank space

3

Dimensions (case size) [mm]

216	2.5×1.6
042	4.0×2.0
083	8.0×3.0
104	10.0×4.0
122	12.0×2.0
116	11.0×1.6

4

Special Code

F	Inverted F
N	Mono Pole (Dual)
M	Mono Pole

5

Frequency [MHz]

example	
2450	2400~2500
5250	5150~5350
1575	1574.397~1576.443

1. Describe Center Frequency  
2. Lower Frequency for Dualband

6

Spec code

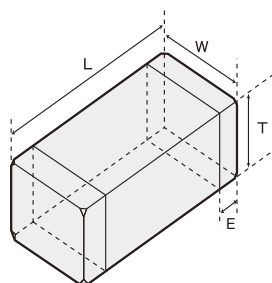
01~	
-----	--

7

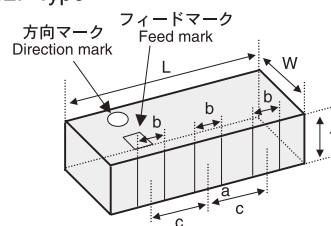
Packaging

-T	Tape & reel
----	-------------

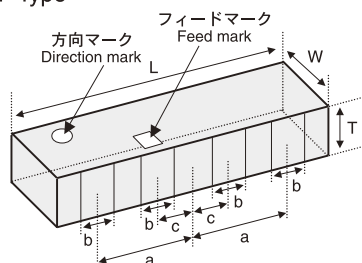
216M Type, 116M Type



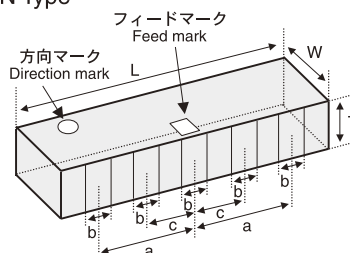
042F Type



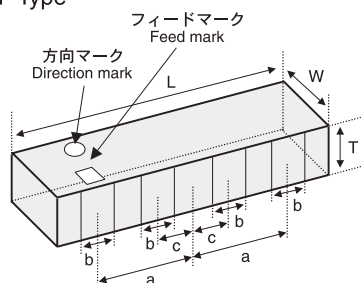
104F Type



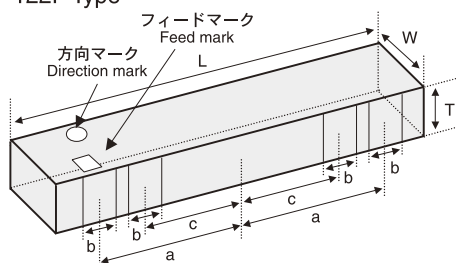
104N Type



083F Type



122F Type



Item	L	W	T	E	a	b	c
216M	2.5 ± 0.2	1.6 ± 0.2	1.6 ± 0.2	0.5 ± 0.3	—	—	—
104F	10 ± 0.30	4 ± 0.30	1 ± 0.30	—	2.5 ± 0.30	1 ± 0.30	1 ± 0.30
083F	8 ± 0.30	3 ± 0.30	1 ± 0.30	—	3.1 ± 0.30	1 ± 0.30	1.15 ± 0.30
122F	12 ± 0.30	2 ± 0.20	0.95 ± 0.15	—	5.1 ± 0.30	1 ± 0.30	3.1 ± 0.30
042F	4 ± 0.30	2 ± 0.20	0.8 ± 0.20	—	0 ± 0.30	0.6 ± 0.30	1.3 ± 0.30
104N	10 ± 0.30	4 ± 0.30	1 ± 0.30	—	3 ± 0.30	0.8 ± 0.30	1.5 ± 0.30
116M	11.0 ± 0.2	1.6 ± 0.2	1.6 ± 0.2	0.5 ± 0.3	—	—	—

Unit : mm

アイテム一覧・電気的特性・代表特性 Part Numbers・Electrical Characteristics・Typical Characteristics

弊社標準基板上での代表的な特性例

Typical Characteristics on Taiyo Yuden evaluation board

Item	EHS (Environmental Hazardous Substances)	Center Frequency (MHz)	Peak Gain	Bandwidth
216M	RoHS	2450 (TYP)	+1dBi	300MHz以上 (VSWR=2)
104F Series	RoHS	2250 (TYP)	+2dBi	300MHz以上 (VSWR=2)
	RoHS	2350 (TYP)	+2dBi	300MHz以上 (VSWR=2)
	RoHS	2450 (TYP)	+2dBi	300MHz以上 (VSWR=2)
	RoHS	2550 (TYP)	+2dBi	300MHz以上 (VSWR=2)
	RoHS	2650 (TYP)	+2dBi	300MHz以上 (VSWR=2)
122F Series	RoHS	2450 (TYP)	+1dBi	200MHz以上 (VSWR=3)
083F Series	RoHS	2450 (TYP)	+2dBi	145MHz以上 (VSWR=3)
042F Series	RoHS	5250 (TYP)	+1dBi	240MHz以上 (VSWR=2)
104N Series	RoHS	2450 (TYP)	0dBi	530MHz以上 (VSWR=2)
	RoHS	5400 (TYP)	-1dBi	1.3GHz以上 (VSWR=2)
116M	RoHS	1575 (TYP)	+1dBi	120MHz以上 (VSWR=2)

セレクションガイド  
Selection Guide

アイテム一覧  
Part Numbers

特性図  
Electrical Characteristics

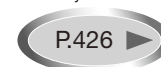
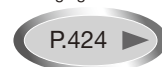
梱包  
Packaging

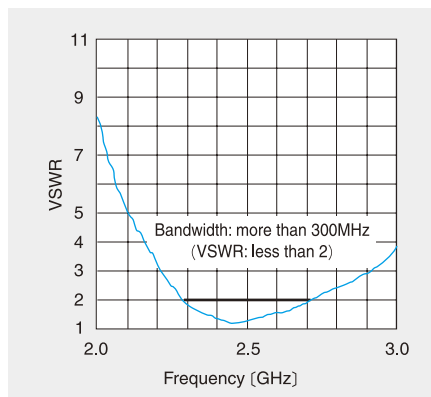
信頼性  
Reliability Data

使用上の注意  
Precautions

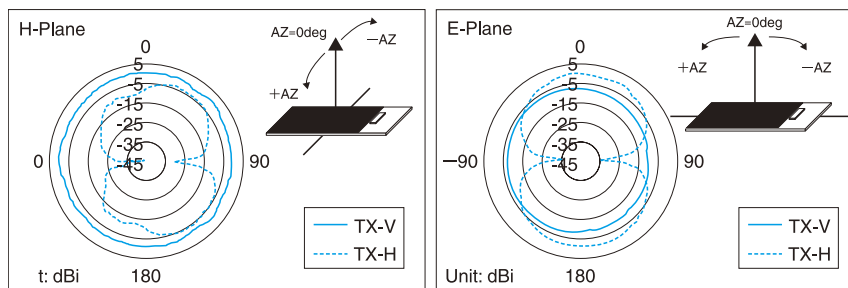


etc

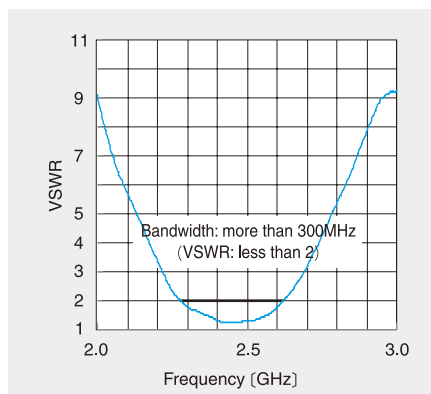




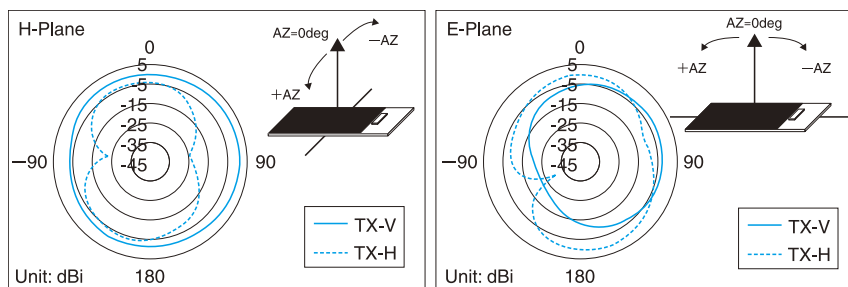
VSWR特性の代表例 (216M)  
Typical characteristics of VSWR (216M)



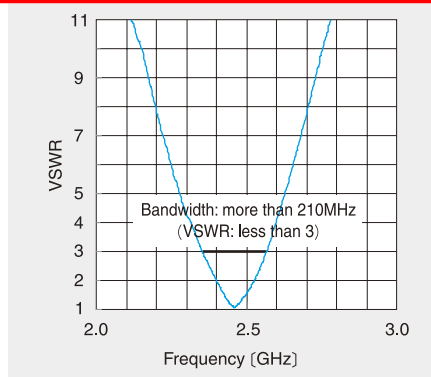
指向性の代表例 (216M @2.45GHz)  
Typical characteristics of radiation pattern (216M @2.45GHz)



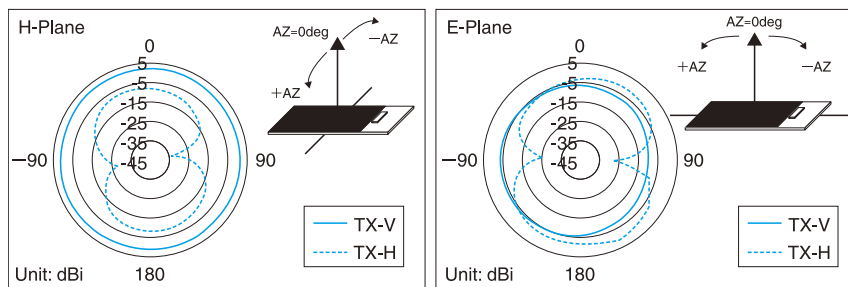
VSWR特性の代表例 (104F2450)  
Typical characteristics of VSWR (104F series)



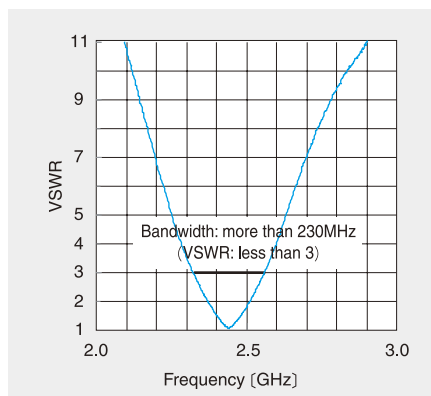
指向性の代表例 (104F2450 @2.45GHz)  
Typical characteristics of radiation pattern (104F series @2.45GHz)



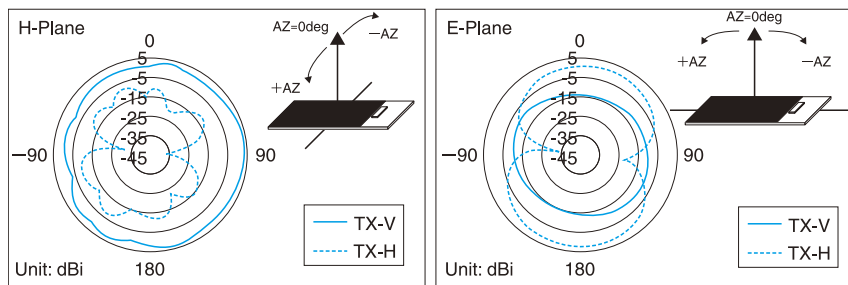
VSWR特性の代表例 (083Fシリーズ)  
Typical characteristics of VSWR (083F series)



指向性の代表例 (083Fシリーズ @2.45GHz)  
Typical characteristics of radiation pattern (083F series @2.45GHz)



VSWR特性の代表例 (122Fシリーズ)  
Typical characteristics of VSWR (122F series)



指向性の代表例 (122Fシリーズ @2.45GHz)  
Typical characteristics of radiation pattern (122F series @2.45GHz)